



Comprehensive Operational Analysis

for the **IndyGo Transit System**

December 2010

Part 2



Financial Effectiveness

Financial effectiveness is measured by a composite performance indicator, combining efficient service delivery with ridership productivity and average fare collected—the gap between fares collected and operating costs. Figure 2.10, Figure 2.11, and Map 2.14 illustrate IndyGo’s existing financial effectiveness.

- All IndyGo routes generate less than a 25 percent farebox recovery ratio.
- The average operating ratio for the IndyGo system is just 16 percent. Five local routes recover less than 10 percent of their operating cost through the farebox.
- The operating ratio for the ICE routes is approximately 49 percent, higher than the local route average.

IndyGo local routes recover just 16 percent of their operating cost through passenger fares.

Weekdays	Farebox Revenue	Operating Cost	Operating Ratio
Local	\$21,218	\$133,527	16%
Express	\$1,782	\$3,654	49%

Figure 2.10: Weekday Financial Effectiveness
Source: IndyGo Fall 2009 APC Data

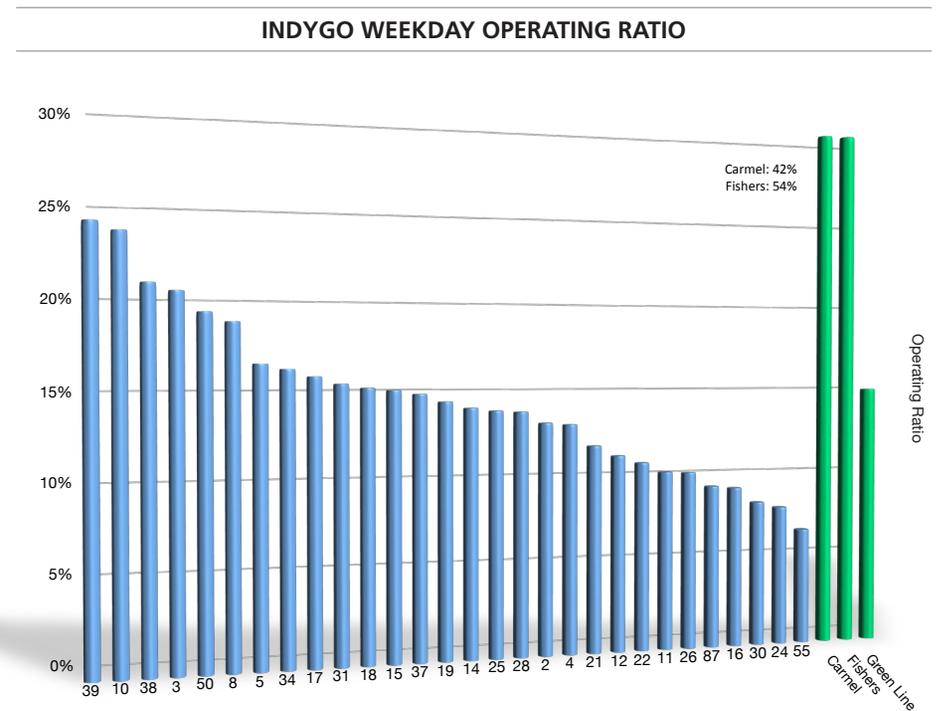
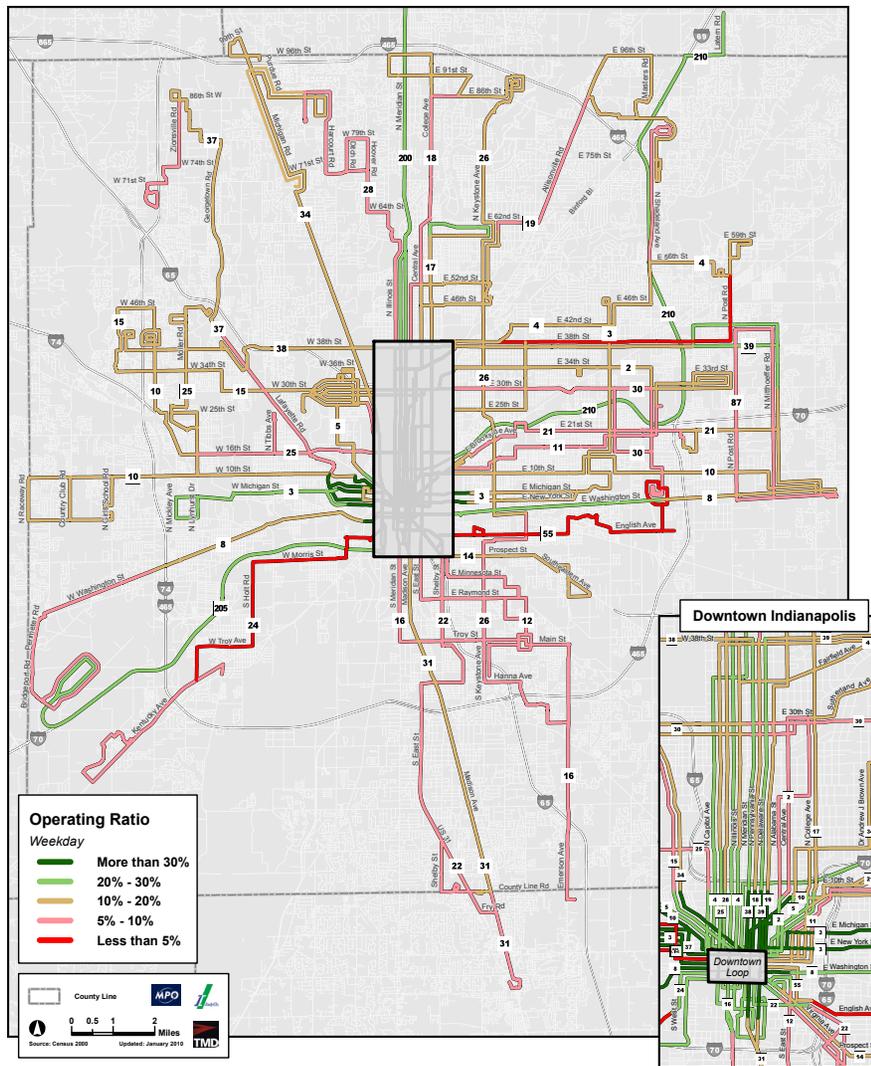


Figure 2.11: Weekday Operating Ratio
Source: IndyGo Fall 2009 APC Data

OPERATING RATIO



Map 2.14: Weekday Operating Ratio
Source: IndyGo Fall 2009 APC Data

Figure 2.12 below shows weekday subsidy per boarding for each IndyGo route, while map 2.15 shows the subsidy perboarding for each route segment. IndyGo local routes have a system average subsidy per passenger boarding of just over \$3.00.

INDYGO WEEKDAY NET SUBSIDY PER PASSENGER BOARDING

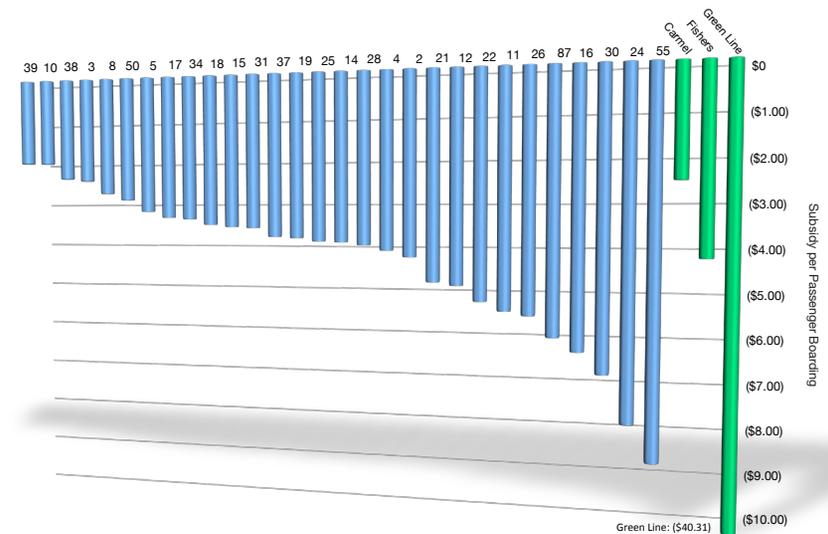
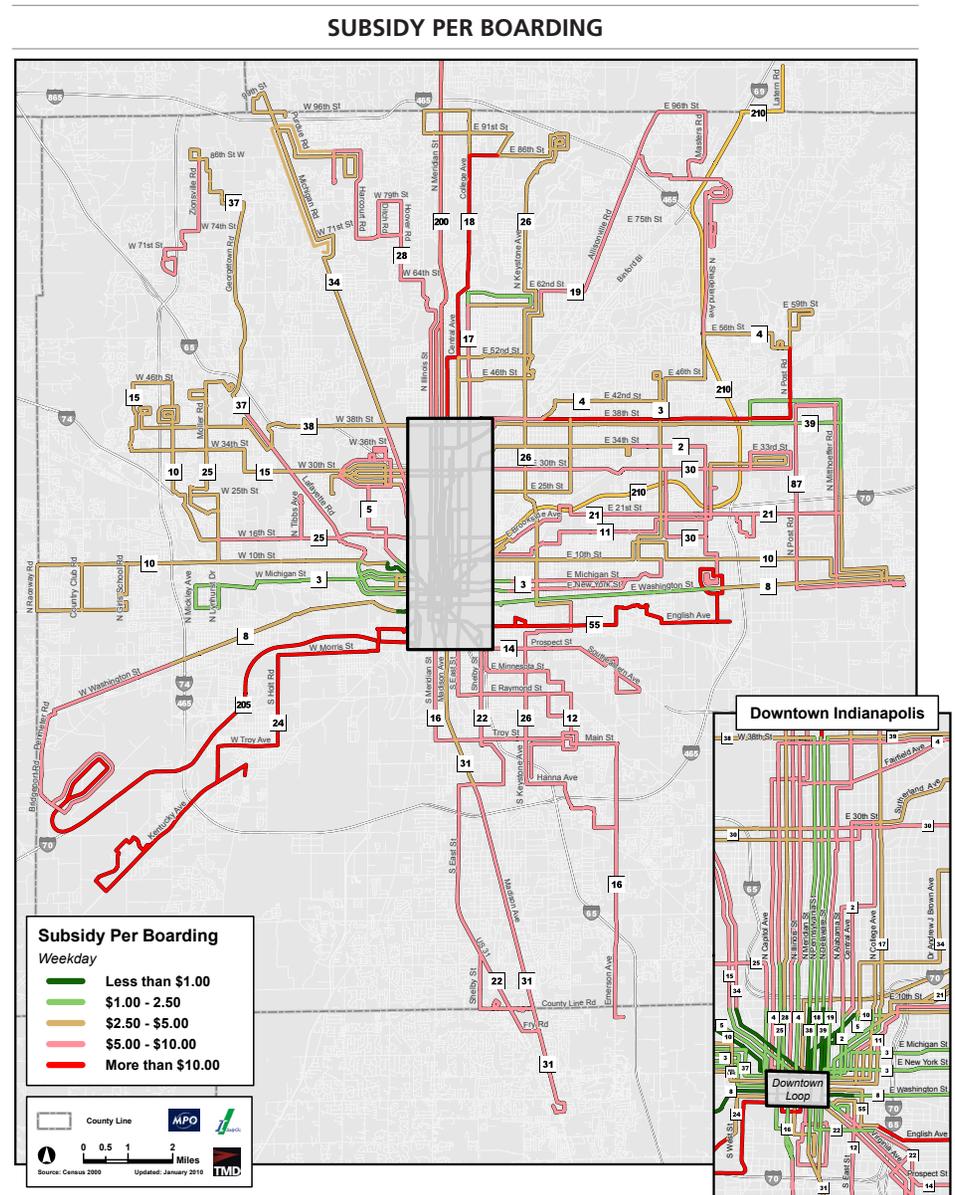


Figure 2.12: Weekday Net Subsidy per Passenger Boarding
Source: IndyGo Fall 2009 APC Data

Similar to segment level productivity, route segments exhibiting the lowest subsidies per passenger boardings are largely concentrated in downtown Indianapolis. Along these segments, subsidies per boarding measure below \$2.50. Western segments of Routes 3 and 10 also exhibit low subsidies per passenger (Map 2.15).

Routes with segments located further away from downtown, particularly in the southern portion of the service area, display the highest subsidies per boarding of over \$4.00.

Investment in services concentrated in downtown is more sustainable from a mobility benefit standpoint.



Map 2.15: Weekday Subsidy per Passenger Boarding
Source: IndyGo Fall 2009 APC Data

Customer Experience

Understanding the customer experience is a critical element in restructuring IndyGo services.

Several measures indicate a customer's perceived quality of service, including:

- **Service Reliability:** on-time performance.
- **Travel Time:** operating speed.
- **Access to Service:** stop spacing and coverage.
- **Vehicle Experience:** overcrowding.

Service Reliability

IndyGo's system-wide on-time performance standard is as follows:

- **On-time:** one minute early to 5 minutes after the scheduled time.
- **Late:** more than 5 minutes after the scheduled time.
- **Early:** more than one minute before the scheduled time.

IndyGo established a system-wide schedule adherence goal of 90 percent of all trips arriving on time. Overall, IndyGo bus services exhibit system-wide on-time performance of 80 percent. This is well below the 90 percent schedule adherence goal. Running time data were collected by the on-board Automatic Vehicle Location systems rather than by supervisor ridechecks.

System-wide schedule adherence is hampered by the downtown bus loop, which creates operating delays and confusion for transferring passengers.

IndyGo is already exploring options to increase layover time downtown to improve reliability.

IndyGo routes display on-time performance below the established 90 percent goal. Improving service reliability will be necessary to maintain service quality and attract new ridership.

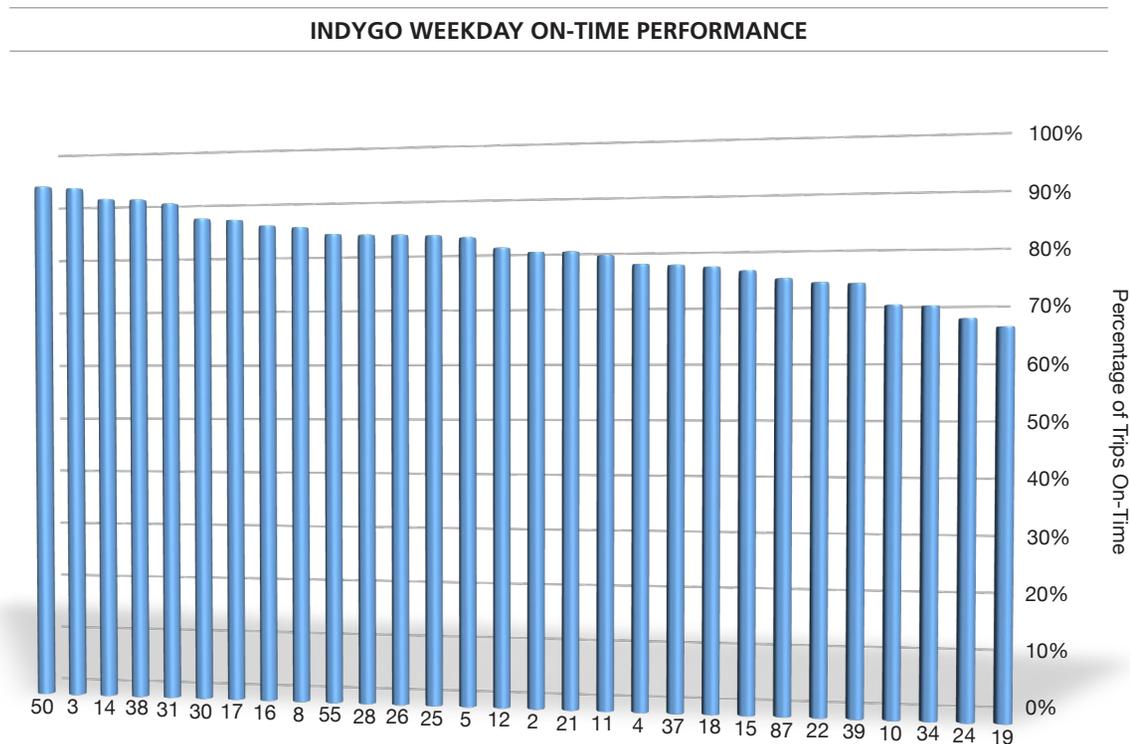


Figure 2.13: Weekday On-Time Performance
Source: IndyGo Fall 2009 APC Data

Travel Times

Reviewing service travel times is useful to identify low operating speeds for which delay reduction strategies can be developed. Safely improving operating speeds on all routes makes service more attractive to customers while potentially increasing service efficiency and effectiveness.

IndyGo local service averages a high operating speed of nearly 19 mph (Fig. 2.14).

Higher operating speeds are observed in the suburban segments of IndyGo routes, where less traffic congestion and lower passenger activity allows for faster travel times. Low stop spacing may be of little impact today with low overall ridership, could be a more significant factor when ridership grows.

Route segments in downtown Indianapolis display the lowest operating speeds due to traffic congestion and delays caused from the downtown loop left turns. Implementing transit priority measures in downtown Indianapolis and a general review of the loop operation will greatly enhance operating speeds.

IndyGo local routes have a high average operating speed of 19 mph due to low congestion and low ridership. Downtown operating speeds were slowest due to left turn delay and high ridership stops.

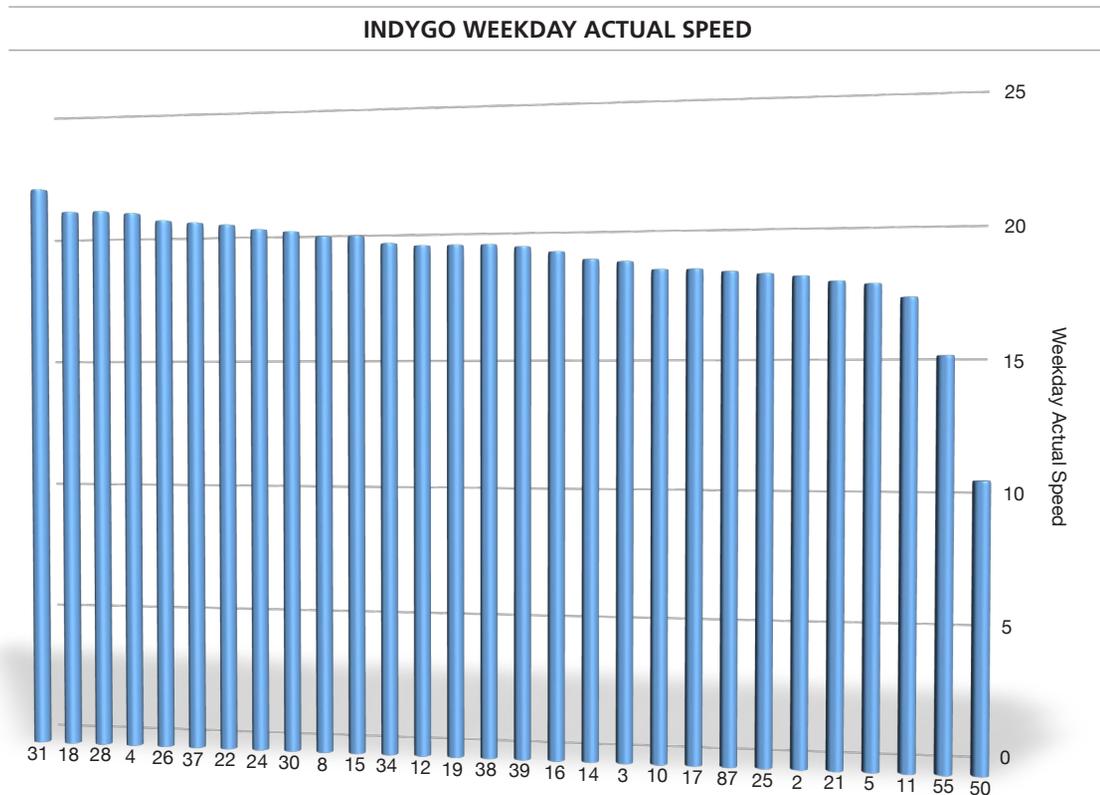


Figure 2.14: Weekday Actual Speed
Source: IndyGo Fall 2009 APC Data

Access to Service

Service Coverage

Service coverage measures how easily IndyGo customers can access its services. Typically, people located within ½ mile of an IndyGo stop are close enough for walk-up access to a service. In the IndyGo service area, approximately 71 percent of residents and 86 percent of employees are located within ½ mile of an IndyGo stop. Additionally, 54 percent of all residents and 71 percent of all employees are located within ¼ mile of an IndyGo stop. As such, the IndyGo network provides coverage to a majority of the residential and employment concentrations in Marion County.

Stop Spacing

Average stop spacing for IndyGo routes is generally between 0.15 and 0.20 miles, and most cross streets on routes have a stop. In some cases, three stops are within easy view of each other. This is excessive, especially in an area where terrain is generally flat. However, sidewalks are lacking throughout most of Indianapolis, which may be contributing to the policy of such close stop spacing. This close stop spacing, while allowing for short walk access trips to transit stops, reduces the overall quality of service due to frequent stopping leading to overall long travel times. The problem will grow as system ridership grows. Expanding average stop spacing to closer to 0.25 miles may enhance service quality by providing adequate access while minimizing stop delay.

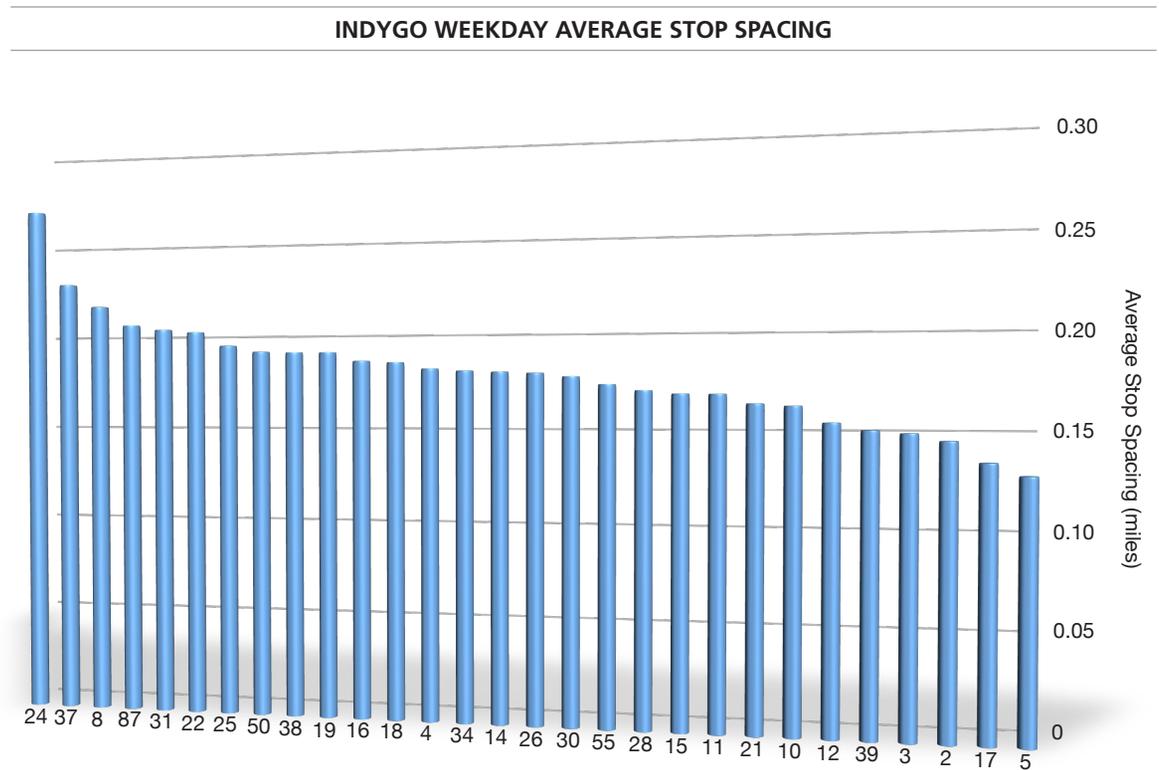


Figure 2.15: Weekday Average Stop Spacing

Average Systemwide stop spacing is a close 0.15 to 0.20 miles. Expanding stop spacing distances may enhance service quality by balancing access with faster travel times.

Vehicle Experience

Overcrowding

IndyGo measures passenger loads based on a seated capacity plus a certain number of standees (total capacity) in order to effectively evaluate service utilization. The weekday peak period load standard for IndyGo local services is 125 percent of the seated capacity.

Overall, IndyGo routes do not have any notable service capacity issues. In the data reviewed, only 3 routes experience trips over the IndyGo load standard, and no more than 2 trips for each route were observed to have capacity issues. Load factors weekdays were typically exceeded only slightly, during peak travel periods at high volume locations such as IUPUI. Similarly, weekend service does not display any notable service capacity issues. Only one service experienced a trip over the load standard during the sampled weekends.

IndyGo routes do not experience any notable overcrowding issues.

2.3: Stakeholder Outreach

Outreach meetings were held to provide local stakeholders with the opportunity to:

- Learn about the IndyGo COA.
- Share their thoughts on how to sustainably improve Indianapolis public transit.
- Provide input into a vision for the future of transit provided by the Indy Connect regional transportation initiative.

Target outreach groups consisted of major stakeholders such as major employers or community groups. The following sections provide a summary of key issues and themes raised by stakeholders during both Phases One and Two.

Key Meeting Themes – Phase One

The Phase One stakeholder meetings provided stakeholders with an overview of the project as well as key study findings. Participants were asked to share opinions about existing IndyGo service and the service area.

A number of recurring themes and ideas were raised by the stakeholders, including:

- Improved Transit Experience
- Altering Behaviors
- Supply versus Demand
- Employer Focused Service
- Service to the Airport

Improved Transit Experience

A main focal point in the downtown meetings was the importance of improving the overall experience of riding a public bus. As the data shows, the majority of people who use the bus system now have no alternative transportation options. Many stakeholders stated that someone who doesn't normally ride a bus would switch to using transit on a regular basis only if the overall transit experience was improved and if other incentives existed such as high gasoline or parking costs. Improvements proposed included new bus shelters, more sidewalks, increased service frequency, more crosstown routes, and the creation and implementation of a transit hub or series of transit hubs.

Most stakeholders supported the idea of making the transportation system in Indianapolis part of the experience of visiting or living in the city. Several meeting attendees pointed out that when they recruit from larger

cities or internationally, public transportation options come up as a point of discussion 75 percent of the time.

Altering Behaviors

As noted above, most people are currently not using the bus system if they don't have to. Based on the meeting responses, many believe that although it is important to make basic system-wide improvements, it won't change rider satisfaction unless a plan is concurrently implemented that will convince many people to modify their travel behavior and become transit riders.

What would motivate someone who always uses their car to consider using transit? With so many cars in the city, Indianapolis faces a mounting congestion problem. Parking space, for many organizations, is lacking and expanding it poses a significant cost to employers. An enhanced, user-friendly transit system could lessen the need to expand parking or roads.

Any improvement in transit will also need a significant marketing effort, as many residents have a lack of awareness of the existing transit system. Increasing education of the system to potential new riders may help alter behaviors. For example, most attendees at the meeting were unaware that an online trip planner was available for IndyGo services.

Supply Versus Demand

What drives usage of the bus system? Right now, for the most part, it is the lack of alternative transportation choices. Other critical factors are convenience, safety, cost, and the quality of the overall experience (ride, facilities, and access). What would drive people away from using cars? One demonstrated example is the cost of

gasoline, as well as other factors such as road congestion. Service needs to be ready when conditions are present to encourage a shift to transit usage, such as what occurred in the summer of 2008 when gasoline prices increased significantly. On the other hand, it was proposed that we shape demand by influencing the location and density of development to ensure that transit has a better chance of generating higher levels of ridership. The key to success is addressing both the supply and demand sides of transit.

Employer Focus

Representatives from some of the major employers within and outside of Marion County were supportive of improved transit service. Employers often receive feedback that bus stops are not located conveniently in relation to the employee work sites and that in cases where the stops are close, travel times are long and services are typically infrequent. If transportation hubs were developed, it is more likely that these large employers would band together to operate shuttle services for employees, especially if there were tax breaks or other incentives to the businesses for such services.

Airport

Some stakeholders raised the issue that public transportation options to and from the airport need to be improved. One attendee stated, "We have a world-class airport, and world-class convention center, but nothing to connect the two." More direct-line access needs to be available from the airport to high-traffic points around the city.

Additional Points

- 1) While routes to and from downtown and from northern suburban communities like Fishers and Carmel have regular commuters on the IndyGo Commuter Express (ICE) demonstration routes, usage has decreased since the shock has abated from the 2008 gasoline price increase. One significant point was that the routes were designed for workers coming from the north to downtown, not necessarily the other way. Many jobs are available in the Carmel and Fishers areas but Marion county residents don't have adequate transportation options to get there after arriving on the ICE service, as there are no local shuttles in these communities. A strong need for additional cross-town connections and express routes was expressed.

- 2) The key feedback from the Avon/Brownsburg meeting was that there isn't much of a current demand for transit service in these communities. With factories in Hendricks County and a 1,200-acre industrial park under construction in Avon, the public has been quiet on the issue establishing transit service. Low demand for transit is, in part, a result of the sprawling layout of these areas, making it hard for transit to meet all needs. The consensus at the meeting was that establishing transit service is not currently a high priority for these communities.
- 3) When meeting attendees were polled as to their own personal usage of IndyGo, the majority were not users of the system.

Key Meeting Themes – Phase Two

Survey results, key issues, and key themes from the Phase One meetings were taken into account with the development of the IndyGo Draft Network Plan. Stakeholders from Phase One were asked to participate in the Phase Two meetings, which included a presentation of the IndyGo Draft Network Plan. Several recurring themes and ideas arose from those meetings, outlined below:

Improved Transit Experience

In order for IndyGo to become more sustainable, regional transit mobility must be strengthened and expanded. Focus on a core transit network is necessary; which involves concentrating routes along major corridors, with increased frequencies. While this can lead to reduced coverage, better-focused and improved service on major corridors will help fuel community redevelopment that is oriented around transit. In addition to focus along a

core network, the overall image and shared perception of public transit in the IndyGo service area must be improved. Enhancing the transit experience can be achieved by rebranding and creating incentives that will attract the car-dependent public.

Financial Sustainability

Transit is not self-sustaining and requires public sources of revenue to comprise the majority of funding. There is a strong need to identify potential funding sources in which a certain allotment would be utilized for infrastructure improvements. As discussed above, disincentives for single vehicle use, such as parking privatization, and incentives for transit use should be emphasized. The involvement of major employers will help support financial sustainability; employers frequently offer public transit passes to employees as a part of benefit packages. Such incentives help encourage transit use and help employers as well

because they are tax-free and typically cost less than other benefits choices.



2.4: Financial Capacity Review

Financial issues are of critical importance to the future of IndyGo. With property and excise tax revenues declining and ridership and fare revenues shrinking in the current economic climate while costs continue to rise, IndyGo—like many of its transit agency peers—faces significant financial challenges. This review forecasts IndyGo’s financial condition from 2010 through 2030.

Operating Costs

Between 2004 and 2010, IndyGo’s operating costs have increased by an average of 6 percent per year (with over 10 percent cost increases in 2007 and 2008). Due to anticipated cost increases and revenue decreases in 2010, operating costs were budgeted at lower levels through various internal economies. Key issues in recent years have been cost increases in labor benefits and the price of fuel.

IndyGo’s operating costs are forecasted from 2010 to 2030 with scenarios presenting annual increases of 1, 3, 5, or 7 percent. These projections assume no service improvements, enhancements, or additional service cuts after 2010 and reflect service levels budgeted in 2010 minus a forecasted decrease in 2011, due to the expiration of three demonstration projects.

Costs could reach anywhere from \$61 million (low 1 percent annual increase) to \$194 million (high 7 percent annual increase) in 2030 depending on how the operating costs increase during the 20-year period. Figure 2.16 above provides a graphical representation of IndyGo’s operating costs forecasted through 2030.

INDYGO HISTORIC & FORECASTED OPERATING COSTS

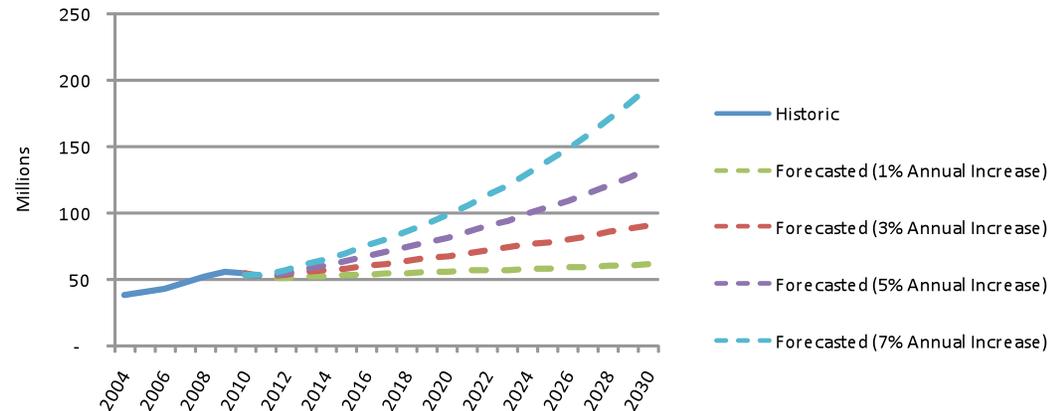


Figure 2.16: IndyGo Historic & Forecasted Operating Costs
Source: National Transit Database (NTD) and 2010 Management and Financial Plan

Capital Costs

IndyGo’s capital spending is highly dependent on the level of capital grants awarded each year and the ability for IndyGo to match those capital funds with the required local funds. It also reflects varying annual needs such as fleet replacement, technology, and facility upgrades, with associated annual spending level variations. Between 2004 and 2008, IndyGo’s capital costs were significantly less than 2009 and 2010 – ranging from \$4 to \$8 million, with the revenue vehicles and information/communication systems being the largest expenditures. Capital expenditures in 2009 and 2010 are significantly higher than previous

years, due to one-time stimulus funding being available and unfunded expenses being included in the budget.

The capital forecast does not assume any additional funds being made available (stimulus or otherwise) that would allow for system expansion or upgrades; however, it is likely that new fare technology or Phase 2 of the Downtown Transit Center may occur as “one-offs” at some point during this timeframe. Capital costs are forecasted to range from \$3 to \$23 million with an annual average of \$14 million. Since most federal funds require a 20 percent local match, this will require, on average, \$2.85 million annually in local funds.

Revenues

IndyGo’s revenues are comprised of the following:

- Operating revenues, including passenger fares and advertising revenues.
- Local property and excise tax funds, which entail 5.23 percent of the City’s tax revenues.
- State Public Mass Transportation Fund, funded through a sales tax. Public transit agencies receive 0.076 percent of the state sales tax and IndyGo receives a large portion of those funds.
- Federal funds, which include the urbanized area formula funds, CMAQ funds, capital grants, and other federal appropriations.
- Other sources, largely comprised of route guarantees and interest.

Between 2004 and 2010, IndyGo’s operating revenues increased by 20 percent from \$45 million to almost \$54 million, partly due to CMAQ grant funds. All of the revenue sources generally increased over the time period; however, many of the sources fluctuated significantly, and current economic conditions will not help matters. The forecast assumes that revenue will continue to increase; however, they are not expected to increase quickly enough to cover the forecasted operating costs.

Overall Funding Implications

As IndyGo has battled with decreasing revenues and increased operating costs, it has continued to sustain a balanced budget through more effective resource utilization, fare increases, flat salaries for employees, etc. If operating costs and revenues continue their most recent

trends, IndyGo will not be able to maintain a balanced budget in the short- or long-term. Figure 2.17, below, shows projected operating costs and revenues for the years 2011 to 2030.

Between 2011 and 2030, there is likely to be an operating funding shortfall of anywhere from \$3 to \$26 million dollars annually, with the average annual gap being \$13 million. The total estimated operating funding gap for 2011 – 2030 is \$263 million. Since costs are predicted to increase at a faster rate than revenues will, the operating funding gap will only worsen during the latter years.

This analysis does not include a capital funding forecast due to the uncertainty surrounding the annual grant receipts and varying needs. IndyGo has typically been successful at obtaining funds to meet capital needs.

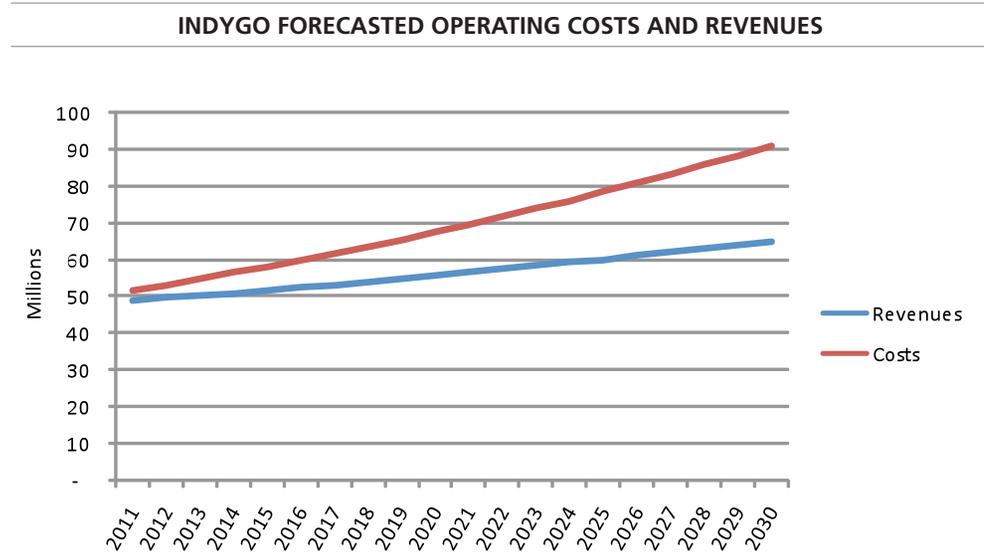


Figure 2.17: IndyGo Forecasted Operating Costs and Revenues
 Note: This forecast assumes operating costs increase by 3 percent annually.

Scenarios

This analysis varied some assumptions to determine the effect on the funding gap. See Figure 2.18, below.

Scenario	Change from Base Case	Forecasted Funding Gap (2011-2030)
Base Case	No Change, Base Case assumes: <ul style="list-style-type: none"> • Operating costs increase at 3% annually • Property tax revenues increase by 1% annually • Ridership grows by 1% annually 	\$257 million
1: Increased Operating Costs	Operating costs increase at 7% annually instead of 3% in the base case	\$1.07 billion
2: Decreased Revenues	Property taxes remain flat (while the base case assumes a 1% annual increase) and the state's sales tax revenues increase by 1% annually instead of 2%	\$321 million
3: Constant Ridership	Ridership does not grow instead of the base case assumption of 1% annual growth	\$280 million

Figure 2.18: Funding Gap Summary of Scenarios

Local Funding Options

In the future, the region should consider increasing its revenues, either through increased operating revenues or a dedicated tax. Raising fares or expanding advertising could increase operating revenues. Options for increased taxes could include increased income tax, sales tax, or a wheel tax.

Currently, Indy Connect, a unique collaboration of private industry members and public entities (including IndyGo and the Indianapolis Metropolitan Planning Organization), has developed a draft plan for a regional transportation system that proposes local funding options for significantly expanded transit service. Community adoption of such a measure would fundamentally alter IndyGo's ability to sustain and expand its operations.

Many variables govern the selection of future funding sources IndyGo might consider, such as: political atmosphere, desired mix of local versus regional versus state funding, stability and/or predictability of each option, diversification, ability to tie source to a transportation use, likelihood of public acceptance, and ease of implementation.

Conclusion

IndyGo's fiscal situation has been known and growing more serious for years. Over time, there has been a significant funding imbalance caused by the disparity between revenue growth and operating/capital expenditure needs. The system has been operating on a "year-to-year" basis, cobbling together various funding

sources in an attempt to maintain service levels and address capital needs.

IndyGo has been aggressive in its cost containment/improvement and system effectiveness efforts, as well as innovative in its attempts to demonstrate transit's potential in the larger Indianapolis community. These efforts have been successful to an extent, but, given current funding limitations, can only achieve limited success in expanding the role of transit in the region.

IndyGo will continue to be aggressive in managing their costs and revenues, but the size of the "funding gap" outlined in the various alternative scenarios developed for this report shows these efforts are not sufficient to preserve, let alone improve, bus service. Left on its current path, IndyGo and local stakeholders annually face the continued bleak choice between how much service to reduce and/or how much to raise transit fares. Neither choice bodes well for those in the community who are dependent on IndyGo to meet their transportation needs, let alone a wider use of transit by the community, which will require more robust service levels.

New funding opportunities being considered under the Indy Connect efforts to establish a regional transportation system may well offer IndyGo an opportunity to secure a more robust funding source, both to sustain the existing system and significantly expand it. However, agreement would be needed for adding IndyGo's sustainability as a key focus for Indy Connect. This should be a priority for IndyGo and the MPO as this opportunity has a relatively high chance of success given its key mission of establishing vastly improved regional transportation system.

3

Service Framework

Guiding Principles for Change

Based on the key findings of the Market Assessment, Service Evaluation, Stakeholder Outreach, and Financial Capacity Review, a Service Framework was developed that consists of key issues and guiding principles for the development of a new service plan.

These principles respond to the opportunities and challenges identified for the existing system and its underlying market condition, and will help develop specific transit services and the overall network that meet the study goals of growing ridership sustainably and providing a platform for future investment in transit.

The basic tenets of the Service Framework will direct the development of future service recommendations:

- **Market Conditions:** Focus firstly on areas closer to downtown Indianapolis where more transit-friendly densities exist; especially along main arterials in this area such as Meridian Street, 38th Street, Washington Street, and 10th Street.

- **Key Corridors:** IndyGo should upgrade services on existing key corridors while working with local government to foster development along these corridors. Planning should improve amenities for these corridors (sidewalks, shelters, etc).
- **Service Hierarchy:** New service plans should emphasize key corridor routes in terms of both frequencies and amenities. In order to grow patronage from choice riders, new products such as limited stop services will be needed. Other tiers will include supporting local routes as well as community and employer-based shuttles. These tiers will only succeed if a strong core network is present. Selected major corridor services may be future candidates for rail.
- **Downtown:** This will remain a key part of the IndyGo network due to the prevailing market conditions. A new operating plan is needed to address both reliability and passenger transfer issues.
- **Service Frequency:** IndyGo should work to establish spontaneous use frequencies on major corridors, while revisiting the level of coverage that is sustainable.

- **Market-Based Services:** Some additional market-based services may be appropriate in the proper setting. These include:
 - » Reverse commute trips to concentrated suburban employment clusters.
 - » Trips into downtown from significant trip generators outside of Marion County.
 - » Community circulators (including denser communities outside of Marion County).
- **Funding:** Despite the possibility of significantly increased funding through Indy Connect, care should be taken to invest such funding in areas where market conditions will best support transit usage. Transit oriented development along major corridors will be as critical to success as service expansion will.
- **Amenities:** In addition to addressing both market and service, transit amenities are in critical need of improvement. Key areas for focus include provision for sidewalks and shelters. Additional items may include new or improved real-time customer information and fare collection.



4

Network Evolution Plan

Introduction

The Ten-Year Network Evolution Plan outlined in this chapter responds to the framework of issues outlined in the previous chapter, which in turn is based on lessons learned from the Market Assessment and Service Evaluation reports as well as outreach efforts.

Sustainability

The Ten-Year Network Evolution Plan's key goal is to sustainably grow the IndyGo system ridership, both the system of today and a more regionally focused system for future years. To this end, the plan has been developed reflecting different underlying assumptions, especially in relation to operating funding levels.

Plan Phases

Across the ten year period, various phased improvements (short, mid, and long term) are planned:

- **Short Term (1-3 years):** The plan examines options to enhance the ridership levels achieved from existing resources.

- **Mid Term (4-7 years):** The plan provides for a significant upgrading of the existing IndyGo urban network in Marion County, with higher frequencies especially on key corridors, together with some new urban and regional commuter express services and new crosstown routes.
- **Long Term (8-10 years):** The plan has more emphasis on new regional express and local circulator routes more regionally outside of Marion County.

The **Short Term Plan Phase** makes the best use of the existing system resources (service hours, peak fleet, and operating funding) as of February 2010 to generate increased ridership through enhanced service levels (more spontaneous use frequencies) on a number of key arterial corridors, while aligning service levels on other routes more in line with existing demand. Should extra funding become available in this phase, then existing services levels can be retained for many routes. However, the key goal in the short term phase of the plan is to begin to establish a set of key arterial corridors that will form the heart of an enhanced IndyGo transit network of the future.

The **Mid and Long Term Plan Phases** assume new opportunities for investment in transit should new funding sources become available. These are critically needed to allow for the most optimal service levels on the core network of key corridors and other supporting transit services in the urban area, and to make possible the implementation of new regional commuter express and local circulator routes for areas beyond Marion County.

Long Range Planning

Beyond the 10 Year Network Evolution Plan, the Indianapolis Metropolitan Planning Organization's (MPO's) Long Range Transport Plan (LRTP), currently being updated, will continue to pursue efforts to create a regional public transit system. This effort will include new corridor services, including possible new Bus Rapid Transit (BRT), light rail and commuter rail initiatives, as well as toll lanes on some interstates for use by express bus services.

Service Performance

In all plan phases, given the large amount of added funding or restructured service, it will be important to establish strong service performance expectations to ensure the best return is achieved from all investment in transit services. It is also very important that the proposed service levels implemented help grow ridership from choice riders, rather than just from those reliant on transit, who dominate ridership today. This is critical for sustaining such investment.

Supporting Market Conditions

In addition to service improvements, the following key issues will need to be addressed in order to grow ridership:

- New investment in facilities such as bus shelters, sidewalks, real time and static customer information, and transit priority measures.
- Key corridor transit service expansion to be matched by development efforts to increase residential and employment densities.
- Disincentives for car use such as congested highways with high speed high occupancy lanes for buses to utilize, as well as higher cost parking downtown and other key employment centers.

Together these factors can create a strong demand for transit, helping it reach many new choice riders.

Service Principles and Guidelines

In response to the framework discussed in the previous chapter, a set of service principles and guidelines was developed, including:

- Service Tiers
- Service Frequencies and Spans

Service Tiers

The following set of service tiers is proposed for the network that would apply across the short, mid and long term parts of the plan:

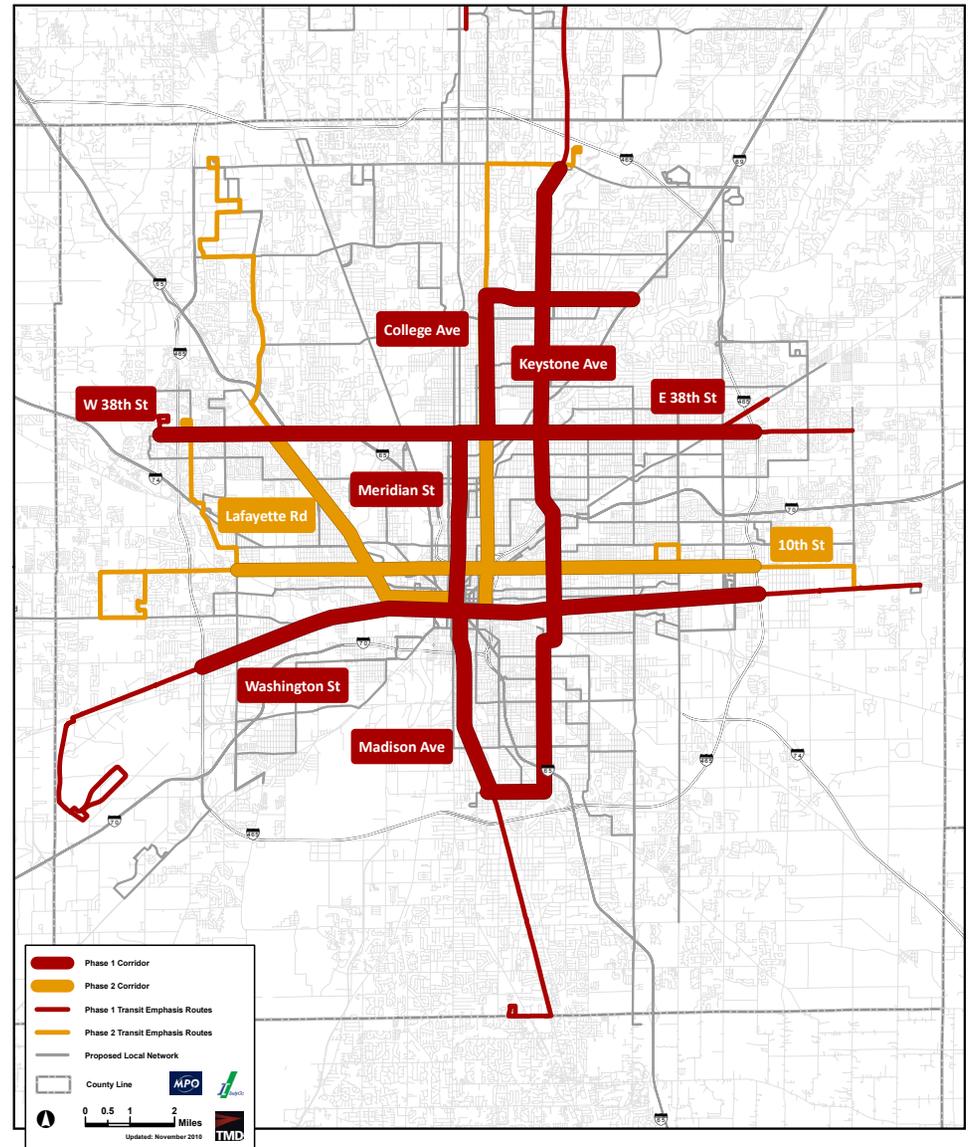
- **Key Arterial Corridor Services** Major routes with service on key arterial corridors. These routes have the highest existing productivity and the best chance of attracting significant ridership growth if service levels are improved. These corridors would also be first priorities for city building and facility improvement efforts.
- **Supporting Local Services** Local transit routes provide network completion, both for coverage and feeding riders to the key arterial corridor services. This category includes both radial and crosstown routes. Some of these routes with a history of low productivity will be maintained at least at hourly weekday daytime service under short term funding constraints, but could retain existing service levels if new funding is made available. New crosstown routes are also planned in the mid and long term phases of the plan.
- **Commuter Express** Provides express services within and beyond Marion County. These services will operate express to/from downtown Indianapolis. They may include reverse commute services to suburban employment centers. Two demonstration routes now operate, (though they are set to end on December 31, 2010) from Fishers and Carmel (Hamilton County), with the plan increasing this group significantly.

- **Community and Employment Shuttles** These provide local circulation and special employment links. The IUPUI shuttle is an example, as are community circulators proposed for various areas in the long term. In addition, new crosstown and feeder bus services are implemented in the long term in support of the Northeast Corridor initiative.

These tiers have associated service levels and spans outlined in the next section of the plan.



TRANSIT EMPHASIS CORRIDORS



Map 4.1: Transit Emphasis Corridors

Service Frequencies and Spans

A key element of the Network Evolution Plan is a major expansion of service frequencies, especially to more spontaneous use frequencies of 15-minute or better.

Minimum service frequencies are proposed as outlined below:

Service Frequencies			
Service Tier	Short Term	Mid Term	Long Term
Key Arterial Corridor Services	15 minute all-day weekday; 30 minute minimum weekend	10 minute peak, 15 minute midday, and 30 minute evening weekday; 30 minute weekend	10 minute or better peak, 15 minute or better midday, and 30 minute evening weekday; 30 minute weekend
Supporting Local Services	30 or 60 minute peak and 60 minute off-peak weekday; 60 minute weekend service on selected routes	15 or 30 minute peak and 30 or 60 minute off-peak weekday; 30 or 60 minute weekend service, all depending on route productivity	Same as Mid Term
Commuter Express	30 minute minimum peak weekday, higher where demand warrants	Same as Short Term, but with more services added. 30 minute minimum peak weekday; better where demand warrants	Same as Short-Term, but with more services added. 30 minute minimum peak weekday; better where demand warrants
Employment Shuttles and Community Circulators	No new services	Varies according to market demand	Varies according to market demand

Figure 4.1: Service Frequencies

The proposed service spans in the short term plan are close to those of today, with potential for expansion in the mid and long term:

Service Spans		
Service Tier	Span of Service	Notes
Key Arterial Corridor Services	Weekdays: 4:30 AM - 12:30 AM Saturdays: 6 AM - 12:30 AM Sundays: 6:30 AM - 9 PM	Subject to funding, will expand until 1 AM on weekdays and Saturdays and from 6 AM - 12 AM on Sundays
Supporting Local Services	Weekdays: 6 AM - 7 PM Saturdays: 7 AM - 7 PM Sundays: 7 AM - 7 PM	Subject to funding, will be expanded until 10 PM on weekdays on selected routes. Constrained short-term funding would see some routes lose weekend service in this phase
Commuter Express	Peak only	Up to 3 hours AM and PM Peaks, based on demand
Community Circulators	Weekdays: 6 AM - 9 PM Saturdays: 7 AM - 7 PM Sundays: 7 AM - 7 PM	Subject to funding

Figure 4.2: Service Spans

The key urban arterial corridor routes would be expected to generate over 30 boardings per revenue hour (as they do today). Local routes with higher potential would be expected to generate over 20 boardings per revenue hour, while lower performing local routes and community circulators would need to reach at least 10 boardings per hour (preferably 15) to warrant retention.

Network Tiers

This section discusses the services proposed to be operated in each network service tier, based on guidelines listed above, and the short, mid and long term phases outlined in the introduction.

Tier 1: Key Urban Arterial Corridor Services

A network of key urban arterial corridor services were identified based on their high productivity, typically over 30 boardings per hour of revenue service. These existing IndyGo bus routes all operate on major local arterial road corridors, and are listed below:

- Meridian Street/East 38th Street (Route 39)
- Washington Street (Route 8)
- 10th Street (Route 10)
- College Avenue (Routes 17/18)
- Madison Avenue (Route 31)
- Lafayette Road (Route 37)

Short Term

These key urban arterial corridors would be the first priority for investment in higher service levels in the short term, subject to either resources from elsewhere in the network or new funding. More significant investment through a new funding measure in the mid and long terms will allow all of these corridors to operate at spontaneous use levels of 15 minutes or better all day weekdays compared to their existing mostly 30 minute service levels. This investment results in a strong core network of key corridor routes.

These corridors should also be the first priority for investment in new facilities and amenities for riders, and for city building efforts to promote overall sustainable mobility. These efforts should continue throughout all phases of the plan.

In the short term, under the constrained funding levels of today, restructuring opportunities have been identified to increase service levels on the following three corridors (in order of priority) using resources freed up from elsewhere in the network:

- Route 39: Meridian Street/East 38th Street
- Route 8: Washington Street
- Route 10: 10th Street

The following structural changes are also recommended to the key arterial routes in the short term:

- Route 10: Removing limited service deviation at western end of route
- Routes 17/18: Consolidate both routes on College Avenue. Route 17 would also extend to Binford Boulevard in the long-term in conjunction with likely corridor improvements in this area.
- Route 31: Extension to Community Hospital South
- Route 37: Straightening/simplifying route through the Park 100 area
- Route 39: Terminate at 38th Street/Mitthoefer Road with loop terminus.

Mid Term

In the mid-term, the College Avenue, Madison Avenue, and Lafayette Road urban arterial corridors should receive similar improvements in service frequency and facilities provided to the initial three key corridor services. Implementation of these improvements requires new operating funding. Further improvements are also planned to be made to service frequencies on the Meridian Street/East 38th Street, Washington Street, and 10th Street corridors in the mid term.

Long Term

In the long term, Rapid Bus is suggested as an extra level of service enhancement for key urban arterial corridors, including improved travel times. This would include new branded stop facilities and higher capacity fleet, new technology such as real time passenger information, and transit signal priority, intersection transit priority and

dedicated lanes, as well as further increases in service levels.

The following corridors are suggested as pilots for this investment:

- Meridian Street/38th Street, with branches to:
 - » 38th Street East
 - » College Avenue to Broad Ripple/
Glendale Mall
- 38th Street Crosstown
- Washington Street
- Keystone Avenue (Route 26 local upgraded)

This higher level of service investment and branding further enhances the overall passenger experience, continuing to grow the market for transit in Indianapolis.



Tier 2: Supporting Local Services

This service tier includes a set of existing secondary IndyGo local routes for network completion, helping provide a more complete urban network, as well as feeding ridership to and from the key urban arterial corridors.

Routes in this tier are:

- Route 2 – East 34th Street*
- Route 3 – Michigan Street*
- Route 4 – East 46th Street*
- Route 5 - East 25th, North Harding Streets
- Route 11 – East 16th Street*
- Routes 12/13 – Minnesota/Raymond*
- Route 14 - Prospect*
- Route 15 - Riverside (West 30th Street)
- Route 16 – Beech Grove*
- Route 19 - Castleton
- Route 21 - East 21st Street*
- Route 22 – Hanna*
- Route 24 – Mars Hill*
- Route 25 - West 25th Street*
- Route 26 – Keystone Crosstown*
- Route 28 - St. Vincent
- Route 30 - 30th Street East
- Route 34 - Michigan Road
- Route 38 - East 38th Street
- Route 55 – English*
- Route 87 – Mitthoefer*

Short Term

In the short term, some of these routes would be maintained at existing service levels. However, a subset of these routes have a history of low service productivity, and would be candidates to be adjusted to lower service levels more in line with demand. This would typically be hourly weekday service, and those routes marked “*” above would be impacted. While service frequencies on these routes decline, existing network coverage is maintained. These changes would fund improved key urban corridor services. This situation may be avoided if new funding is identified in the short term.

In the short term, a number of structural changes to existing supporting local routes are proposed:

- Route 4 trips will terminate at the Finance Center rather than Ivy Tech Lawrence due to limited ridership at Ivy Tech. The 38th Street and Community Hospital North patterns for this route will also be discontinued due to low ridership.
- Route 5 will have a simplified terminus arrangement westside at 36th Street, omitting the existing loop off of 30th Street.
- Route 11 trips to Crossroads will be replaced by Route 30 services. All Route 11 trips will terminate at Western Select.
- Route 12 will operate via its Minnesota Street pattern only, terminating at Wal-Mart Market. A new route is proposed for Raymond Street in the long term to replace Route 13, subject to additional funding.
- Route 18 will travel via College and 86th Streets past Nora Plaza to Keystone at the Crossing to remove

unproductive alignment and provide a more direct trip to these key retail centers.

- Route 19 will move off Central Avenue to Meridian Street between downtown and 38th Street, but serve Central Avenue between 38th Street and 46th/52nd Streets, in conjunction with Route 18 moving from Meridian Street to College Avenue. Route 19 will also move from Allisonville Road to Keystone Avenue for better access to Keystone at the Crossing and Castleton Malls.
- Route 21 will terminate at Noble of Indiana (no off peak extension to Washington Street).
- Route 22 will terminate at Southern Plaza (Community Hospital South to be served by Route 31)
- Route 25 will terminate at Renn/Moller with no extension to the nearby Wal-Mart.
- Route 26 will terminate at Glendale Mall at Broad Ripple at its northern end (replaced by Route 19 north of there – see above) and Wal-Mart Market at its southern end (low usage south of there).
- Route 28 will be straightened in the 73rd Street area to remove unproductive alignment, with Routes 28 and 34 revised to not overlap each other.
- Route 30 crosstown on 30th Street is recommended to be redirected downtown via Meridian Street to improve its very low productivity. Route 30 would also operate strictly on Shadeland Avenue, rather than some trips on Arlington where Route 3 already operates. Every second peak trip (once per hour) would serve Crossroads instead of Shadeland Avenue. This replaces current Routes 2 and 11 service to Crossroads.

- Route 34 will no longer serve deviation north of Depauw Boulevard due to low ridership.
- Route 55 will no longer serve English Village due to low ridership and will travel directly via Brookville Road.
- Route 87 would operate both directions on Mitthoefer Road rather than looping back via Post Road.

Mid and Long Term

In the mid term, it is proposed to enhance service levels to 15-30 minute peaks, 30-60 minute off peak based on demand, and subject to new funding.

It is also proposed to restructure the following routes:

- Route 2 in the long term will extend to Lawrence via Post Road.
- Route 11 in the long term will extend to Washington Square Mall.
- Route 14 in the long term will extend via Sherman Drive through Beech Grove, terminating at the Kmart at Emerson/Thompson.
- Route 24 will be altered to terminate at Mann Road in the mid term. The Ameriplex area west of there would be served as a reverse commute operation of new commuter express service from Plainfield area.
- Route 25 will terminate at Speedway Shopping Center in the long term. Its segment on Moller Road is replaced by Route 91 new crosstown service.
- Route 26 will be upgraded to a BRT corridor on Keystone Avenue in the long term, linking Carmel with the

University of Indianapolis.

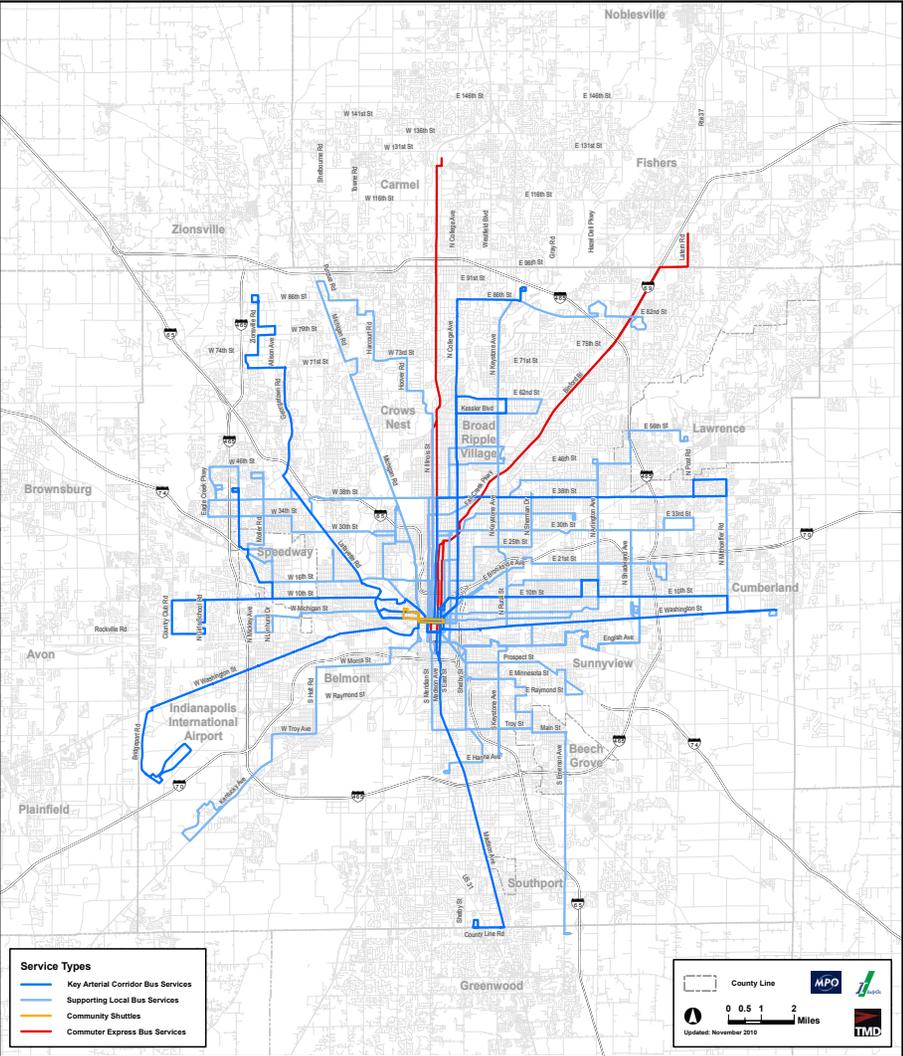
- Route 30 would revert back to its current crosstown format in the long-term, once high frequency BRT is operating on Meridian Street, facilitating easy transfers for travel downtown.
- Route 38 to become an east-west crosstown to Lawrence on 38th Street in the mid-term. This route will become a crosstown BRT service in the long term.
- Add new crosstown Route on 82nd-86th Street from Community Hospital North to Traders Point via Castleton and Keystone at the Crossing Malls and Park 100

In the mid and long term, a range of new crosstown routes are proposed:

- Route 56 Kessler-56th Street
- Route 71 71st Street
- Route 86 82nd/86th Street*
- Route 88 Emerson
- Route 89 Arlington
- Route 91 Eastside
- Route 92 Raymond Street
- Route 93 Westside

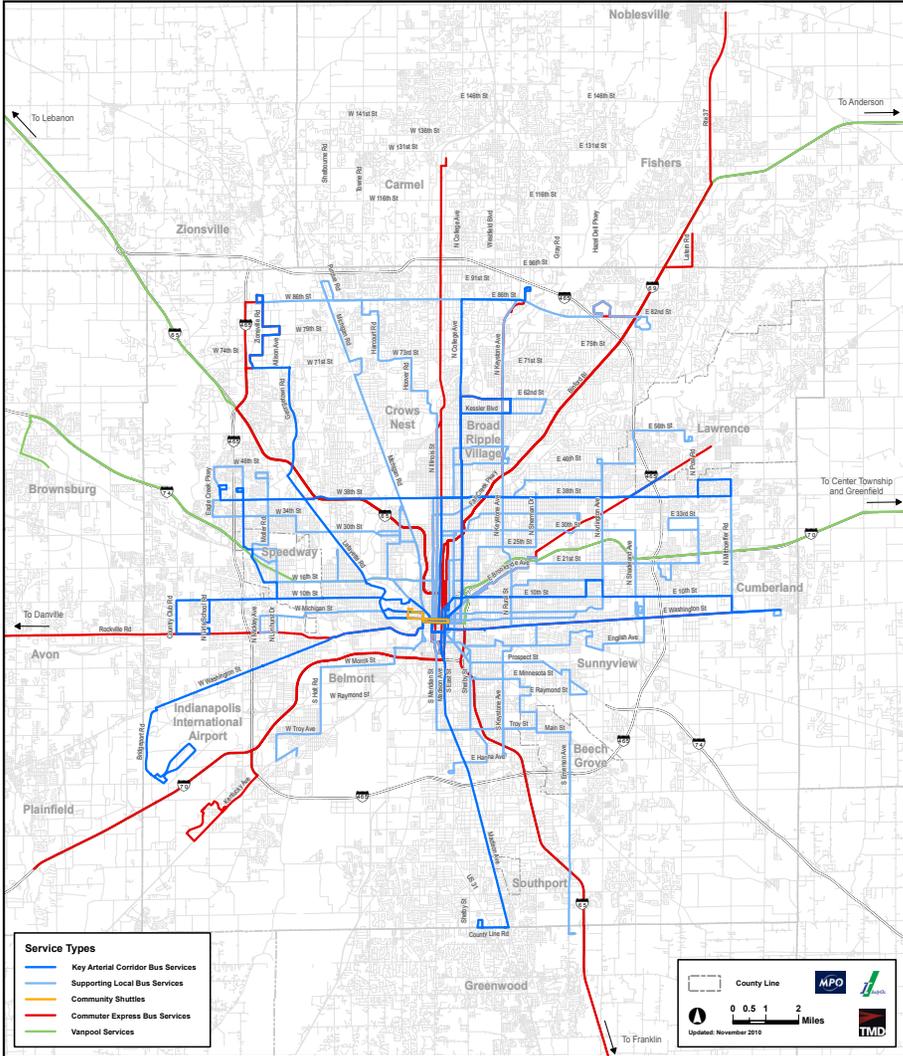
* Route 86 is the only new crosstown service planned in the mid term.

PROPOSED SHORT TERM BUS SYSTEM PLAN



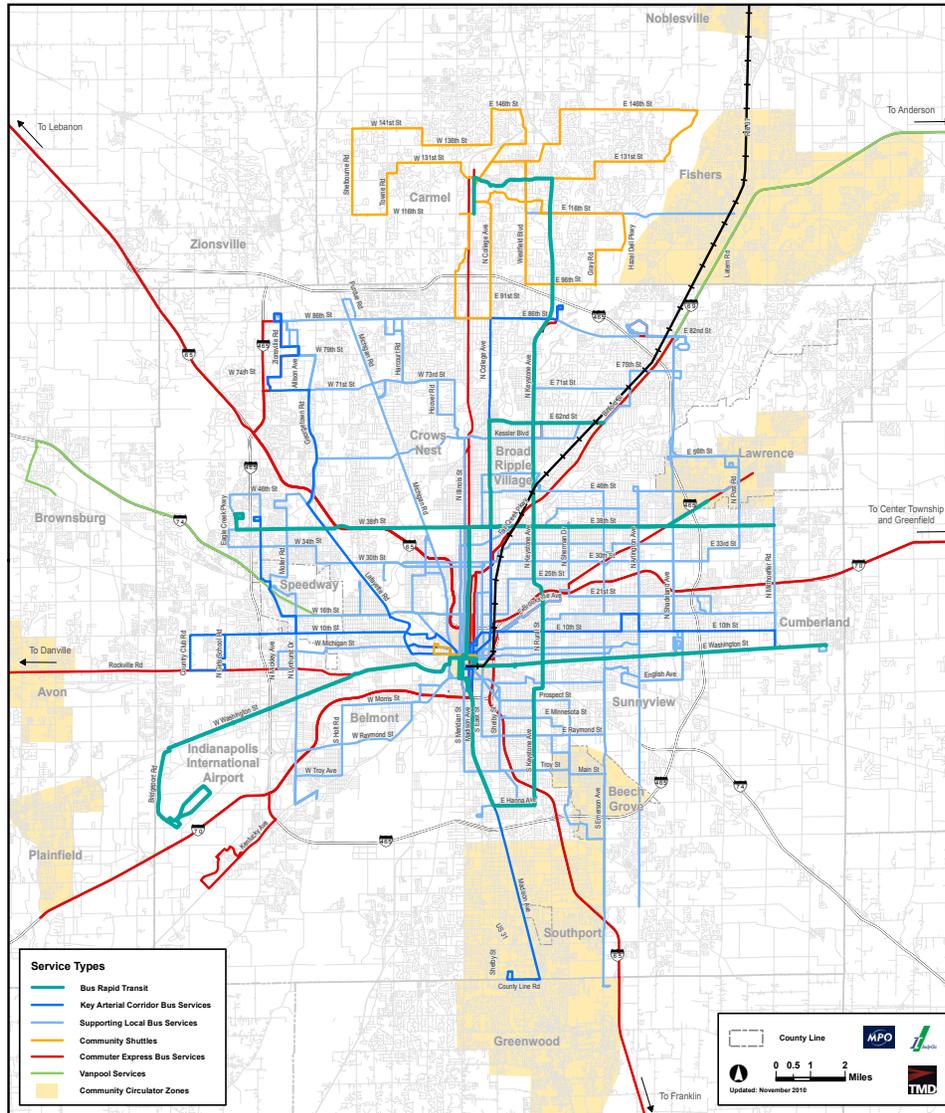
Map 4.2: Proposed Short Term Bus System Plan

PROPOSED MID TERM BUS SYSTEM PLAN



Map 4.3: Proposed Mid Term Bus System Plan

PROPOSED LONG TERM BUS SYSTEM PLAN



Map 4.4: Proposed Long Term Bus System Plan

Tier 3. Community Circulators

Short and Mid Term

The only circulator service included in the short and mid term phases of the plan is the existing Redline IUPUI shuttle, which currently operates every 15 minutes and would be retained weekdays, linking the campus with downtown transit and parking.

Long Term

In the long term, as many communities within and beyond Marion County grow in population and employment densities and transit supportive structure, it is expected that several of these communities will be able to support internal community circulator fixed route transit services. For example, the City of Carmel is already investigating a small network of such circulator routes. This would be a model for other communities where demand response type services may evolve into fixed route community circulators.

Other candidate cities where future underlying conditions may support community circulator services include Fishers, Noblesville, Lawrence, Greenwood, Beech Grove, and Southport, though other communities may lack reasonable underlying market conditions to support such services. The approach of working with each city for collaboratively developing such options appears to be the best first step forward. These communities may also be potential funding partners for such services, and additional funding is needed for these services.

Other than the community circulators mentioned above, it is recommended that the IUPUI shuttle and a new second shuttle operate to connect Union Station with

various parts of downtown Indianapolis, once new corridor initiatives have been introduced (this may occur in or beyond the ten year plan period).

Tier 4: Commuter Express

Short Term

As outlined earlier, conditions are favorable for establishing a network of commuter express services linking the region with downtown Indianapolis, the most transit supportive employment center in the region.

The commuter express service network is currently limited to one service from each of the Fishers and Carmel communities. However, these were established as pilot services with fixed term funding due to expire in late 2010. It is important that new funding be found to continue running these successful existing Carmel and Fishers commuter express routes. There is no funding available in the short term within the Network Evolution Plan. It must be secured from other sources, and this should be a high priority action.

Mid Term and Long Term

Based on market analysis, there appears to be sufficient potential demand to warrant additional commuter express routes for communities such as Noblesville, Greenwood/Franklin, Avon/Danville, and Plainfield. Sufficient new funding for such services is first likely to become available in the mid term. Other growing communities beyond Marion County appear likely to have much lower travel demand to downtown Indianapolis and therefore are more suited to alternative travel models such as van pools.

Service Level	Mid Term	Long Term
	Express Markets	Express Markets
15 minute bus service		Fishers
		Plainfield, Mooresville, Guilford Township
		Noblesville
30 minute bus service	Avon, Danville, Center Township (Hendricks)	Avon, Danville, Center Township (Hendricks)
	Carmel, Westfield	Carmel, Westfield
	Fishers	Center Township (Hancock), Greenfield
	Greenwood, Franklin, New Whiteland, Whiteland	Greenwood, Franklin, New Whiteland, Whiteland
	Plainfield, Mooresville, Guilford Township	Lebanon, Center Township (Boone)
	Noblesville	
Potential vanpool service	Anderson	Anderson
	Brownsburg	Brownsburg
	Center Township (Hancock), Greenfield	
	Lebanon, Center Township (Boone)	

Figure 4.3: Service Level Breakdown

Within Marion County there are also locations where peak express bus services to downtown Indianapolis may be successful, such as at major retail/commercial nodes where surplus parking is available for establishing formal Park and Ride lots.

The following locations are suggested as origins for pilot new express services to downtown Indianapolis from across Marion County, and have been included in the mid term phase of the Network Evolution Plan based on the expectation of additional funding being available in this phase:

- Traders Point
- Lafayette Square Mall
- Washington Square Mall
- Glendale Mall
- Keystone at the Crossing
- Castleton Mall
- Lawrence Town Center

These routes would be retained in the long term only if they are successful in attracting reasonable ridership. These express services, and their regional commuter

express service counterparts, can include reverse commute trips to larger suburban employment centers such as Ameriplex, Park 100, and the 82nd-86th Street corridor near I-465 North.

Table 4.4 below outlines potential new regional commuter express or vanpool services to downtown Indianapolis in the mid and long term, together with estimates of their potential travel demand overall to downtown.

Airport Express

The Greenline Airport Express is not a core transit function and is attracting very low ridership despite significant service investment. IndyGo is investigating a replacement operator for this service under commercial model. This service is not recommended for funding in the network plan.

Downtown Operating Plan

Given the largely radial nature of the IndyGo bus network today and into the future, it is important to review the downtown transit service operating plan.

Existing Operating Plan

Currently 27 IndyGo bus services circulate through downtown via the “downtown loop”, a one-way loop via Ohio Street, Capitol Avenue, Maryland Street, and Delaware Street, a series of left turns.

There are a number of key issues relating to this operating plan that need to be taken into account when considering improvements.

- Most existing downtown passenger activity is concentrated at stops on Ohio Street

- Passenger activity downtown includes terminating/originating trips as well as an equally large amount of transfers between buses (buses are due downtown at the same time for facilitating these transfers)
- Buses operate inbound and return directly outbound from downtown via the loop, without being allocated a layover, helping avoid congestion from congregating buses
- The lack of a layover period makes it difficult for services to depart punctually outbound, and makes it impossible for passengers to reliably know if their connecting service has already left.

To help address the above problems with the loop, IndyGo is currently adding layover time to a number of routes to test if these can be provided successfully. The layover would occur at existing stops on Ohio Street.

Other options are discussed below, both for the short term or longer term, and each has benefits and challenges in trying to enhance downtown transit operations and customer service. All options require significant planning beyond the scope of this plan. They are provided to help guide future planning efforts for downtown transit.

Short Term

Focus services on Ohio Street where almost all passenger activity occurs downtown. Abolish the downtown loop operation and create on-street layover locations at the east and west ends of Ohio Street. This approach will limit the mileage and time buses spend downtown, while maintaining service for the majority of existing riders and enhancing reliability for departures and connections. This option will offer some operational savings

from slightly shortened routes, and does not require any significant capital investment. Identifying layover locations will be the challenge for implementing this option.

Longer Term

If the Union Station area becomes a key regional transit hub, then a new transit center at the adjacent Post Office site (already studied) has been suggested for all downtown terminating routes. It is important to note that this location is remote from the heart of downtown, and many people will be better off still transferring between buses at Ohio Street where many routes will first meet. The greatest need of arriving travelers at Union Station is likely to be downtown circulators. This option will add operating cost to many northside local IndyGo routes where cycle times are already tight due to the extra distance to be travelled to reach the Post Office site. There will also be high costs for land and construction and ongoing maintenance for this facility. This location therefore may not be the optimal choice.

Optimal Location

Work to date on downtown operations has typically focused in available land parcels. An alternative conceptual approach is to plan for a downtown transit center within one-quarter mile of Monument Circle, placing it at the geographic heart of downtown, within easy walking distance of most jobs. Such a location, presumably an off street facility, would also serve well transferring passengers in a potentially attractive all weather facility.

The MPO and IndyGo should continue to explore options in this area for a new transit center, mostly likely as part of a commercial redevelopment project. The focus should be on creating an integrated high quality all

weather customer and operational facility in a central location for the most convenient downtown access and transferring, without adding operational costs. The challenge would be integrating such a facility with future proposed rail services at Union Station (over a third of a mile away), though the importance of this needs to be considered in relation to best meeting the other roles of a new downtown transit center.

This discussion of downtown operations concludes the overview of the Network Evolution Plan. More detail of plans in terms of route maps and metrics are provided in an appendix to this report. The final sections of the report provide an overview of the plan's operating metrics, facility plan, implementation planning, and managing the performance of the proposed new network.

Operating Plan Metrics

This section reviews the resource requirements for each plan phase in terms of service hours and fleet; the key determinants of the costs for the plan. Annual costs, revenues, and subsidies are then outlined for each of the three phases of the plan. This report also outlines capital costs for new fleet. Other capital needs are discussed in the following section.

Of key note is that the short-term plan is assumed to make best use of existing fleet and service hours. This is in significant contrast to the mid and long term phases which see significant expansion of service hours and fleet, requiring a new source of funding.

	Scenario	Short Term	Mid Term	Long Term
Revenue Hours	Weekday	1,433	2,866	4,634
	Saturday	780	1,180	2,794
	Sunday	603	1,130	2,750
	Annual	440,957	857,730	1,486,458
Revenue Miles	Weekday	19,676	40,678	65,875
	Saturday	10,701	15,692	37,859
	Sunday	8,147	14,994	37,378
	Annual	6,046,349	12,058,611	20,934,676
Cost	Weekday	\$141,777	\$287,136	\$461,143
	Saturday	\$77,179	\$115,717	\$273,593
	Sunday	\$59,414	\$110,749	\$269,469
	Annual	\$43,612,451	\$85,660,401	\$147,447,554
Revenue	Weekday	\$22,601	\$45,626	\$66,054
	Saturday	\$10,215	\$13,159	\$27,236
	Sunday	\$6,336	\$8,956	\$19,469
	Annual	\$6,662,005	\$12,838,405	\$19,389,320
Subsidy	Weekday	(\$119,176)	(\$241,510)	(\$395,089)
	Saturday	(\$66,963)	(\$102,558)	(\$246,357)
	Sunday	(\$53,078)	(\$101,793)	(\$250,000)
	Annual	(\$36,950,446)	(\$72,821,996)	(\$128,058,234)

Figure 4.4: Operating Plan Financial Metrics

	Existing	Short Term	Mid Term	Long Term
Peak Buses	120	120 (+0)	274 (+154)	379 (+105)
Capital Cost	\$0	\$0	\$123,200,000	\$84,000,000

Figure 4.5: Operating Plan Fleet and Capital Metrics



Facility Planning

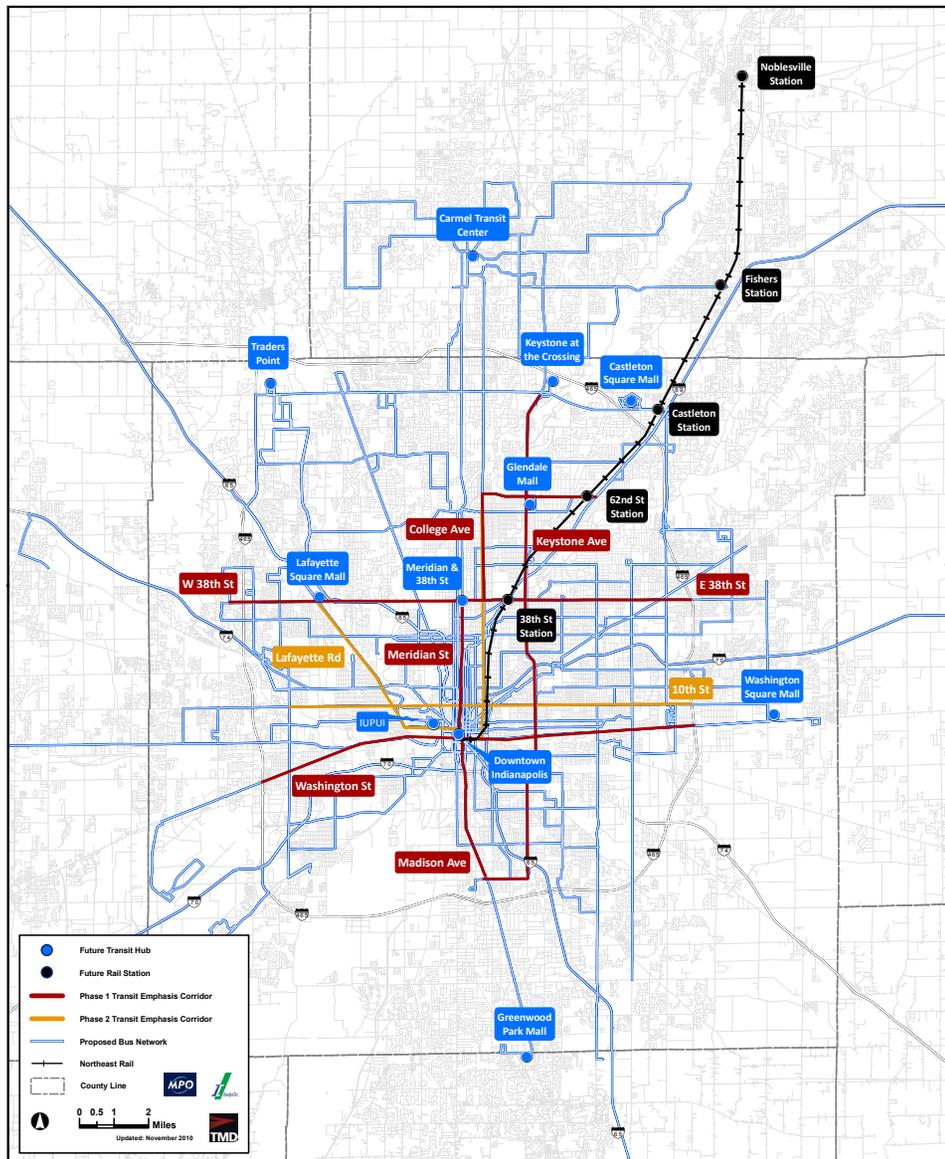
As outlined earlier, enhanced facilities will be a key part of enhancing the overall passenger experience. The following are opportunities to enhance facilities for the IndyGo transit network. Due to the required funding and planning for implementing these, most would be expected to occur in the mid to long term phases of the Network Evolution Plan.

- **Sidewalks** The City of Indianapolis is understood to be planning a major investment in new sidewalks. This will be crucial to improving access to IndyGo. The MPO should work with the city to ensure key bus corridors are priorities to receive sidewalks where none exist today, with enhanced access to supporting local bus routes following in a second phase.
- **Shelters and Stop Amenities** While IndyGo has a regular program of implementing bus stop shelters, additional effort will be required to fund upgraded stop facilities beginning with the key urban arterial corridors. The Rapid Bus initiatives proposed in the long term provide further opportunities for such investment. In addition to shelters, the long term may bring additional funding for items such as new technology in the form of real time information at stops. These items will require ongoing maintenance and IndyGo with the MPO should ensure that responsibilities are clear and funds adequate for this work.
- **Park and Rides and Transit Centers** New key transit network nodes will emerge more clearly as IndyGo transit services are increased. These will include transfer locations and Park and Ride lots. Funding should be set aside for building enhanced facilities at such likely locations as shown on Map 4.5 below. The expanded commuter express bus services in the mid and long term will require new Park and Ride facilities, though many will be possible joint ventures with existing retail centers. There will be ongoing leasing and maintenance costs needing to be budgeted for such new facilities. Downtown Indianapolis will also likely be provided with a new transit center facility for IndyGo services during the life of the Network Evolution Plan.

- **Operating Speed Enhancements** Some capital funds should be allocated for new technology such as transit signal priority as well as new transit priority lanes at intersections and along key urban arterial corridors.

The plan overall shows a threefold increase in many metrics in the long term, bringing the size of the regional transit system more in line with its peer systems. Growth of this size will require careful management.

FUTURE TRANSIT HUBS & TRANSIT INVESTMENT CORRIDORS



Map 4.5: Future Transit Hubs & Investment Corridors

Implementing the Plan

This section reviews the process of implementing the Network Evolution Plan.

Short Term

The short term plan can be implemented within the existing resources, these being the operating, capital, and financial resources available to IndyGo as of February 2010. Increased service proposed for the Washington, 10th, Meridian, and 38th Street corridors in this phase can be accommodated through revised service levels on many supporting local and basic coverage routes, as outlined earlier. These three corridor enhancements could be implemented either in one package or in separate stages. The implementation in one package limits the disruption of associated changes to just one service change, while introducing all of the plan's benefits sooner.

The short-term implementation does not rely on a new major facility or any fleet increase, though ongoing implementation of new shelters, sidewalks etc. should continue under existing programs throughout the short term and subsequent plan phases. The short term phase is unlikely to see any significant transit priority or real time information implementations, though planning for these should be well advanced by this stage.

Implementation of the short term changes would require a hearing process for changes of this magnitude. However, once this process is completed, implementation can follow within a reasonably short period, allowing for sufficient time for internal and public documentation to be prepared and distributed.

Mid and Long Term

The mid and long term improvements require significant new staff and fleet, which will need to be coordinated with the availability of funding, as well as construction of significant new fleet and training of new operators, and delivery of supporting infrastructure such as new bus shelters and information signage. The fleet growth will also require a new operating base.

All of the above factors require that such implementation be phased in over a number of years, both for the mid and long term phases. This plan does not outline suggested phasing of each term. This would be more appropriately conducted closer to the implementation years, allowing for further review of population growth and existing service performance to ensure best use is made of any new funding. The phased approach also allows for adjustments to earlier implementations based on factors such as ridership response.

Service Standards – Managing the Network

Background

The IndyGo transit network already has a set of guidelines for managing services. This service standards document provides IndyGo with both service guidelines (deployment and design warrants) to guide development and refinement of the transit network and services; and service performance standards to be used in managing the IndyGo transit network to continuously improve service quality, productivity, and financial performance.

This section discusses possible enhancements to IndyGo's existing service standards that could help the agency manage services in the future.

Service Guidelines

Market Conditions

A key determinant of what transit service can be sustained in each part of the IndyGo service area is the underlying market conditions. Key market indicators include population and employment densities, transit dependent population indicators such as low income and low vehicle ownership densities, and population segments such as working age youth/students and seniors traditionally more likely to need to use transit. Linear corridors with high travel demand are also good indicators of where transit services will attract higher ridership.

Within the IndyGo service area, the downtown area (between I-65, I-70, Miley Avenue, and 16th Street) has the highest population and employment densities, transit-oriented demographics, and high travel demand volumes which can sustain moderate to high levels of fixed route transit service. This includes both major core bus routes on key arterials as well as supporting local bus service on local streets.

Service Tiers

The IndyGo system is recommended to expand its definition of local bus services to include four main tiers of service that respond to the varied market conditions present across the service area.

These were outlined earlier in this report.

1. Key Arterial Corridors

2. Supporting Local Services
3. Community Circulators
4. Commuter Express Services

The purpose of the above service tiers is to recognize the different levels of service each tier can successfully sustain. Each will be reflected in having different service levels (frequencies and spans).

Key arterial corridors will be the first priority for additional investment in service levels, in particular to implement spontaneous use (10 min. or better) frequencies.

Local service will feed demand to or from the key arterial corridors and major network destinations. They will generally support at least 30 minute peak, 60 minute off peak service and can be increased in response to higher demand. This category includes basic coverage services operated where no other service exists within reasonable proximity but market is only able to support minimal service levels.

The market-based services are developed for circumstances where all day regular fixed-route transit services are not required but service is warranted during selected time periods to meet specific high volume travel demand. This category includes tiers covering community circulator and commuter express services, and shuttle operations such as IUPUI – downtown Indianapolis. Like any other tiers, these are subject to minimum service levels and performance standards consistent with their various markets served.

Stop Spacing

During a recent bus stop sign replacement program, IndyGo developed the following guidelines for minimum stop placement distances:

Service Type	Spacing Range	Typical Spacing
Central Business District	300 – 1,000 ft	600 ft
Urban Areas	500 – 1,200 ft	750 ft
Suburban Areas	600 – 2,500 ft	1,000 ft

Figure 4.6: Stop Spacing

As highlighted earlier in this report, most IndyGo routes now have these very close average stop spacing, which could be problematic with associated very slow transit operations leading to failure to increase ridership significantly. Stop spacing requirements will be important in balancing acceptable travel times and convenient access to bus stops. It is suggested that a standard of 0.2 mile (1,000 ft) spacing for key corridor services, with minimum 0.15 mile (800 ft) spacing be adopted for supporting local and basic coverage routes. Commuter express services should serve a maximum of two Park and Ride stops and four downtown stops. New stop spacing standards should be implemented as the necessary sidewalk infrastructure becomes available.

Route Spacing

Route spacing of 8-10 blocks appears to make transit more sustainable in Indianapolis. However, as highlighted earlier in the report, past history and current network services are spaced 4-5 blocks apart in many urban areas. More emphasis has been placed on this greater coverage than on services frequencies available to each route. There are some underlying factors which have supported maintaining coverage as first priority, including lack of sidewalks throughout much of the city, and

the city policy of not snow plowing minor streets. These factors impede access to alternative service.

As service levels are increased on key corridors, some adjacent local routes will likely decline significantly in performance as more riders move to the key corridor service, while others may retain sufficient ridership to meet minimum service performance standards. This issue will require careful monitoring on a route by route basis as service improvements are made to key corridor services.

Service Performance Standards

Service performance standards may be measured using a number of industry best practice key performance indicators (KPIs). These fall into two distinct groups, the first focused on efficiency and effectiveness, the second on service quality.

The following four key measures are discussed below:

- Efficiency and Effectiveness:
 - » Passengers per Revenue Hour (service effectiveness or productivity)
 - » Subsidy per Passenger Boarding (cost effectiveness)
- Service Quality:
 - » Service speed
 - » On-Time Performance (service reliability)
 - » Load Standards (service comfort)

IndyGo should regularly review service performance against these service metrics to help maximize ridership and system sustainability, through matching service

demand, supply, and maximizing quality within the financial and operational capacities of the agency.

Summary of Measures

Service Efficiency and Effectiveness Measures

Passenger per Revenue Hour

This KPI measures service effectiveness or productivity based on ridership generated for each hour of service operated. There are different expectations for each service tier, with each market-based service having their standard set in line with market expectations.

Service Type	PPH Standard
Key Arterial Corridor Services	30
Supporting Local Services/ Community Circulators	15
Commuter Express Services	25

Figure 4.7: Passenger per Revenue Hour

Subsidy per Passenger Boarding

This KPI measures the service cost effectiveness as defined by the net additional operating cost to IndyGo per passenger beyond the average passenger fare.

Service Type	Subsidy per Passenger Standard
Key Corridor	\$2.50
Supporting Local Services/ Community Circulators	\$5.00
Commuter Express Services	\$5.00

Figure 4.8: Subsidy per Passenger Boarding

All measures above should be viewed as lower limits. Every effort should be made to continuously improve service so that limits can be revised to reflect such improvements. Measures should never be moved downward, though reporting can reference underlying systemic conditions (recession etc.) that may help explain systemwide performance declines.

Service Quality Measures

The following measures are important to monitor in terms of both service design and delivery quality.

Service Speed

This KPI measures service speed as scheduled. The measure is calculated by dividing in actual platform hours (time buses are in service including trip and layover time) by revenue miles for each route. This measure is important to be monitored as services need to maintain reasonable speed to retain and grow ridership. Efforts in areas including stop spacing, management of intersection congestion, street supervision, and operator training are all required to maintain higher service speeds (through limiting delay).

Service Mode	Service Speed
Arterial BRT Bus	18-21 MPH
Core Arterial Route	15-18 MPH
Supporting Local Services/ Community Circulators	12-15 MPH
Commuter Express Services	30 MPH

Figure 4.9: Service Speed

On-Time Performance

This KPI measures service reliability as defined by adherence to the published service schedule within a range of up to one minute early to five minutes late.

In order to achieve targeted on-time performance, which is measured at timepoints, service running times need to be calibrated regularly based on existing conditions and best practice operations to achieve the schedule adherence standard.

IndyGo already has a high KPI for on time performance, which may prove achievable with a modified approach to scheduling services through the downtown loop (the current loop system without layover leads to unreliable outbound departures).

Service Mode	On-Time Standard
Bus	90%

Figure 4.10: On-Time Performance

Load Standards

This service quality KPI establishes load standards for various vehicle types. These emphasize the acceptability of some patrons standing for short distances during peak periods, while ensuring seating is available for all riders during normal off-peak conditions.

Service Mode	Service Standard
Local Bus Services	125% during peaks
Commuter Express Services	100% during peaks

Figure 4.11: Load Standards

Any vehicle operating at high-speeds on highways for extended distances requires all passengers to be seated, reducing the maximum load on these services to 100 percent of seated capacity.

While loads are typically not a problem area for IndyGo now, this may change as service expansion fuels ridership growth. It will be important to monitor loads during this period of expansion.

Reporting

The reporting of the above measures should occur for each period between service changes (e.g. three per year). An annual report with recommendations responding to the past year's performance should be compiled for approval in time for implementation of improvements each fall service change.

This process of monitoring will be especially important in tracking service performance over the life of this plan to determine if it has met its objective of a regional transit system with significantly but sustainably increased ridership.